

DaimlerChrysler AG

Patent Claims

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1. A method for controlling a drive train for a motor vehicle, with the drive train (10) having

- a drive machine (14),
- an automatic gearwheel variable-speed transmission (19),
- an automatic clutch (12), which is arranged between the drive machine (14) and the gearwheel variable-speed transmission (19), and
- at least one control device (49),

15 wherein

- the control device (49) makes a selection, as a function of selection rules and vehicle parameters and/or operating variables of the motor vehicle as to whether the clutch (12) will remain engaged or disengaged when a gear change takes place from an original gear to an intended gear in the gearwheel variable-speed transmission (19), and

- when a gear change is carried out with the clutch (12) engaged, the rotation speed of the transmission input shaft (11) is synchronized to the intended rotation speed in the intended gear by influencing the drive machine (14),
- characterized in that

- a gear change is carried out exclusively with the clutch (12) disengaged
- after initial starting-up of the drive train (10) until all of the vehicle parameters which are relevant for the selection process have been determined by the control device (49),
- and/or
- when a malfunction is identified in a component

in the drive train (10).

2. The method as claimed in claim 1,
characterized in that

- 5 - the control device (49) carries out at test as
 a function of test rules to determine whether
 the gear change can be carried out with the
 clutch (12) engaged, and
10 - the selection depends on the result of the
 test.

3. The method as claimed in claim 2,
characterized in that
the test can be carried out as a function of vehicle
15 parameters and/or operating variables of the motor
vehicle.

4. The method as claimed in one of claims 1 to 3,
characterized in that
20 the selection and/or the test are/is carried out at
least in some operating areas as a function of the
intended gear for the gearwheel variable-speed
transmission (19).

25 5. The method as claimed in one of claims 1 to 4,
characterized in that
the selection and/or the test are/is carried out at
least in some operating areas as a function of
variables which describe the environment of the motor
30 vehicle.

6. The method as claimed in claim 1 or 2,
characterized in that
the vehicle parameters are variable.
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7. The method as claimed in claim 1,

characterized in that
the gearwheel variable-speed transmission (19) has a
synchronization device (transmission brake 52) which
can be driven by the control device (49) and by means
5 of which a transmission input shaft (11) can be braked,
and, when changing up with the clutch (12) disengaged,
the control device (49) selects whether the
synchronization device (transmission brake 52) will be
driven, with the transmission input shaft (11) thus
10 being braked, or whether it will not be driven.

8. The method as claimed in claim 1,
characterized in that
at the start of changing-down operations, the clutch
15 (12) remains engaged and the control device (49)
- drives an actuating element (gear-changing
actuator 48) in order to deselect the original
gear,
- determines a time since the driving of the
20 actuating element (gear-changing actuator 48),
- monitors whether the original gear has been
deselected, and
- if the determined time exceeds a threshold
without the original gear having been
25 deselected, the clutch (12) is disengaged.

9. The method as claimed in claim 8,
characterized in that
the stated threshold is dependent
30 - on vehicle parameters of the motor vehicle
and/or
- on operating variables of the motor vehicle
and/or
- on variables which describe the environment of
35 the motor vehicle.